Navigational

Echo Sounders
&
Speed Logs

SKIPPER

Version 1.07

Introduction

SKIPPER was established as a brand in 1973 by SIMRAD. In 1984 SKIPPER became an independent Norwegian owned company, and started to convert from a trading to a production company.

Today 90 % of the products are produced by SKIPPER.

SKIPPER is situated in Oslo, Norway, in modern facilities with production, training, warehouse and office at the same location. This makes SKIPPER a flexible and reliable supplier of navigational electronics.

SKIPPER Electronics AS is ISO 9001 certified, and all the navigational electronics is IMO Wheel-marked.

SKIPPER Electronics manufactures marine electronics for the merchant fleet as well as for fishing and Navy purposes. Our design is based on experience, research and traditions.

Our products are known worldwide for reliability, quality, sophistication and good value for money.

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Navigational Echo Sounders

SKIPPER GDS101

The SKIPPER GDS101 is one of the markets most sold Navigational Echo Sounder. The Echo Sounder graphics are continuously shown on the LCD along with relevant Navigational details. External connectors are provided for printer, VGA and NMEA in/output.

Highlighted features as:

- NMEA 0183
- 38, 50 and 200 kHz transducer options
- Colour LCD 10.4” display
- Alarm functions
- Memory functions
- IMO Wheelmark

The SKIPPER GDS101 contains history memory that stores depth, time and other available navigation data continuously for the preceding 24 hours. This and current information can also be printed out.

The GDS101 has 3 transducer connections as standard with resonant frequencies of 38, 50 and 200 kHz. Only one can be shown on the display at a time, by choosing the correct transducer in the menu. A wide range of transducers are available to fit the vessels requirements.

All IMO requirements are met or exceeded and most standard interfaces are avalable.

Specifications for the GDS101:

Power Supply	AC: 115 V/ 230 V 50/60 Hz. DC: 20-32 V Auto Switch over
Power Consumption	50 W at 24 V, 70 W at 115 V or 230 V
Display	Night/Day (10.4”) Colour LCD screen with adjustable backlight
Mounting Dimensions	300 x 320 mm
Printer	External printer
Memory	24 Hour storage.
Ranges	Selectable from 0-1600 m
Measuring Accuracy	Error less than 1 %
Frequencies	Standard, 38, 50 and 200 kHz, selectable from keybord. (Other freq. on request)
Output power	Up to 1 kW, adjustable
Depth alarms	Deep and shallow water alarms
Calendar / Clock	Year-month-day / Hours-min. 24 hour system

Outputs	Trigger and bottom-pulses
	Alarm relays
	Analogue 4-20 mA, and 0-10 V for depth
	Detected video
	NMEA 0183
	External VGA
	Printer
Inputs	100/200 pulse input for speed
	NMEA 0183 for speed, position, heading and time
Languages	English, French, German, Spanish, Russian, Norwegian
Options	Remote depth indicators
	Remote keyboard. Printer
Classification	Made to IMO performance standard
Service	Available in most major harbours, world-wide through extensive dealer network

SKIPPER GDS102

The SKIPPER GDS102 is a dual channel navigation Echo Sounder with a large, colour LCD display. The Echo Sounder graphics are continuously shown on the LCD along with relevant navigational details. External connectors are provided for printer, remote VGA and NMEA in/output.

Highlighted features as:
- NMEA 0183
- Transducers between 10-49 kHz and 50-255 kHz can be connected.
- Colour LCD 10,4” display
- Two frequencies can be simultaniously shown on the display
- Alarm functions
- Memory functions
- IMO Wheelmark

The SKIPPER GDS102 includes history memory storing depth, time and other available navigation data continuously for the preceding 24 hours. Information can also be printed out.

GDS102 is prepared for connection of 1 or 2 transducers with a resonant frequency in the range of 10-255 kHz. A wide range of transducers are available to fit the vessels requirements. This includes both high and low frequencies, for depth recordings down to 5000m!

Specifications for the GDS102:

Power Supply	AC: 115 V/230 V 50/60 Hz DC: 20-32 V Auto Switch over
Power Consumption	50 W at 24 V, 70 W at 115 V or 230 V
Display	Night/Day (10.4”) Colour LCD screen with adjustable backlight
Mounting Dimensions	300 x 320 mm
Printer	External printer
Memory	24 Hour storage
Ranges	Selectable from 0-5000m
Measuring Accuracy	Error less than 1 %.
Frequencies:	
Channel 1	From 50 kHz to 255 kHz, 1 kHz step
Channel 2	From 10 kHz to 50 kHz, 1 kHz step
Output power	Up to 2 kW, adjustable
Depth alarms	Deep and shallow water alarms

Calendar / Clock	Year-month-day / Hours-min. 24 hour system
Outputs	Analogue 4-20 mA, and 0-10 V for depth
	NMEA 0183
	Alarm relays/NMEA Alarm
	External VGA
	Printer
Inputs	NMEA 0183 for speed, position, heading and time
Languages	English, French, German, Spanish, Russian, Norwegian
Option	Remote depth indicators
	Remote keyboard. Printer
Classification	Made to IMO performance standard
Service	Available in most major harbours, world-wide through extensive dealer network

SKIPPER ED165

The SKIPPER ED165 is a paper recording Navigational Echo Sounder.

Highlighted features are:

- NMEA 0183
- 50 or 200 kHz transducers can be mounted
- Digital depth display
- 6“ Paper recorder
- Depth Alarm
- Recorder off mode
- IMO wheelmark

Specifications for the ED165:

Power Supply	AC: 115/230 V 50/60 Hz. DC: 20-40 V Auto switchover
Power consumption	Max 100 W
Recording	6” paper
Transmitter power	Up to 500 W
Transducer frequencies	50 or 200 kHz
Depth alarm	Adjustable from 1-99m
Weight cabinet	10 kg
Accuracy	Better than 1 %
Outputs	2 x NMEA 0183
Classification	Made to IMO performance standard
Service	Available in all major harbours, world-wide through dealer network

SKIPPER IR 301 Digital Depth Repeater

The SKIPPER IR 301 is a remote depth indicator using NMEA signals. It gives accurate digital depth indication based on signals from the SKIPPER ED165, GDS101 or GDS102 Echo Sounders. SKIPPER IR 301 can also be used with Echo Sounders from other manufacturers, when these have NMEA 0183 output.

Highlighted features are:

- Depth indication
- Alarms
- Shows position of transducer in use
- Bracket or panel mounting

It is possible to select between two transducers on the SKIPPER IR 301. Brightness is adjusted on the front panel, or from a remote dimmer control.

Specifications for the IR 301:

Power Supply	DC: 10-40 V
Power Consumption	3 W
Display	7 segment. 20 x 11 mm digital readout.
Mounting Dimensions	124 x 124 mm. Bracket or panel mounting.
Front plate	144 x 144 mm to DIN standard
Depth	59 mm
Weight cabinet	1 kg
Outputs	1 x NMEA 0183
Inputs	NMEA 0183 protocols
	Remote dimmer input
Classification	IP 56
Service	Available in most major harbours, world-wide through extensive dealer network.

Transducer and sensor location

Echo Sounder transducer location

There is always uncertainty in placing the transducer in the vessel. SKIPPER products have several different mounting options; tank (ice protected, aluminium and steel), Gate Valve for single and double bottom.

The mounting position of these different tanks or Gate Valves are usually the same. The most important parameter is to place the transducer in a position where there is a minimun amount of air bubbles in the waterflow passing the hull of the ship. The transducer should therefore be mounted on a flat, horizontal surface on to the hull, and preferably in the front of the ship, where the forward transom is reaching down to the water level (see figure).

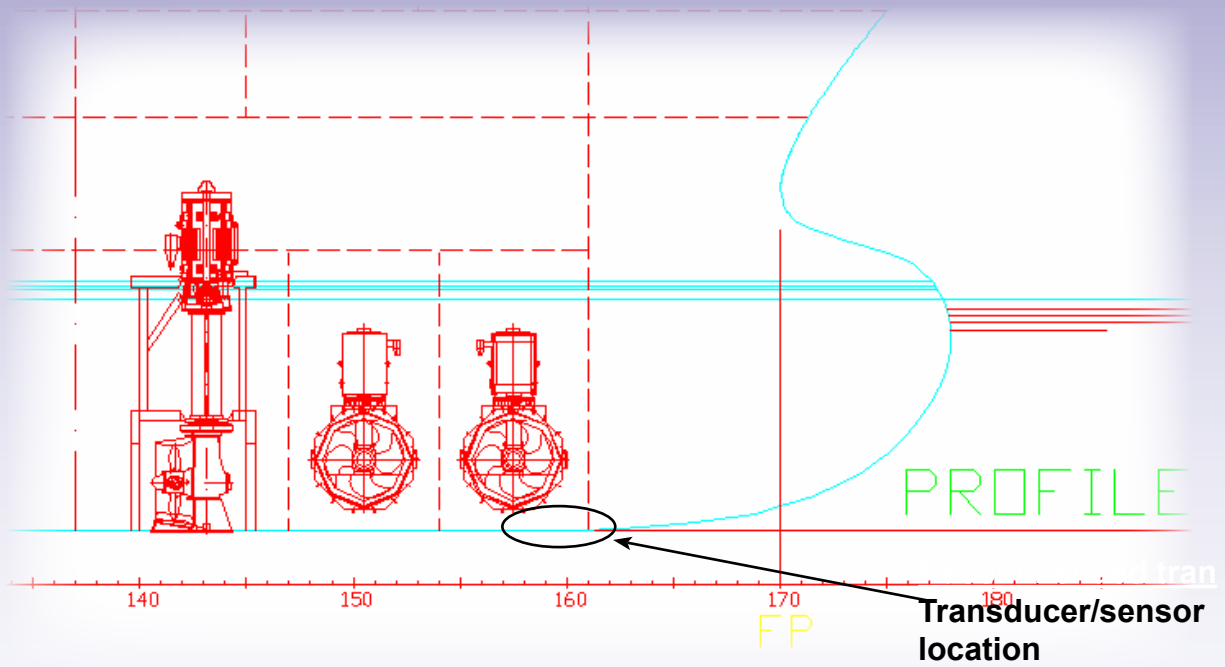
The result of the placement of the transducer can only be recommended, and it is not possible to guarantee the correct position, even on vessels of the same design from the same yard.

It is always recommended to place the transducer in a dry compartment, for easier maintainance of the sensor, especially when mounted in Gate Valve.

In some cases there may be an option to place a special hull fitting for the transducer in order to avoid the air bubbles.

Feel free to contact SKIPPER for a recommendation for the transducer placement.

When installing two different transducers, we recommend to install the 200 kHz aft in the vessel and the 50 kHz transducer in the forward part of the vessel. The aft transducer will normally work only at low speeds.



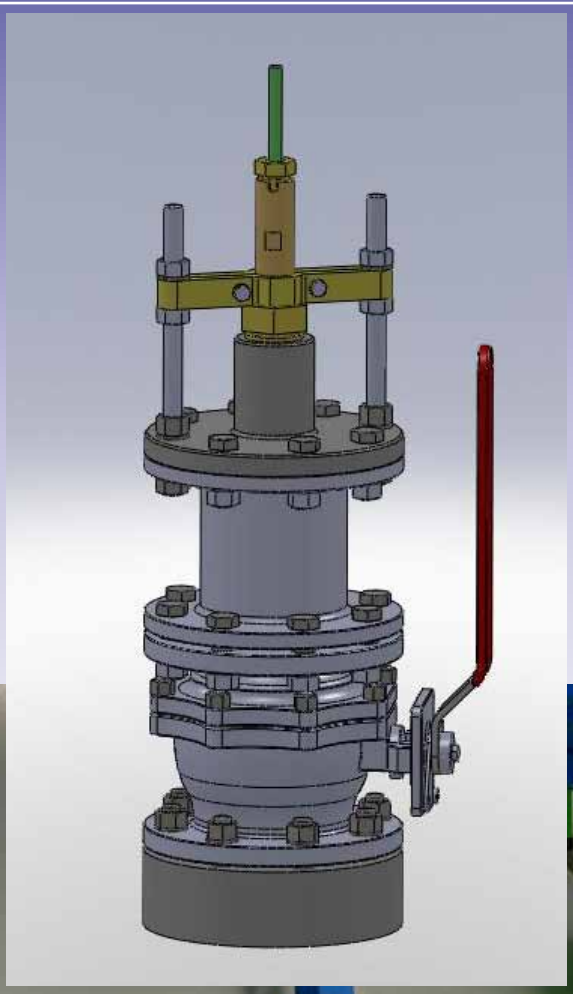
Speed Log sensor location:

The same basic rules are true when mounting the sensor for Doppler Speed Logs. Air bubbles should be avoided.

The sensor placement for the EML is not that critical because this sensor uses the electromagnetic field in order to measure the speed of the vessel. However EML should be placed away from any object that can interfere with water flow.

It is never recommended to place Speed Log sensors aft in any vessels.

When installing both Echo Sounder transducer and Speed Log sensor, place the Speed Log sensor forward in the vessel.



Transducers for Echo Sounders

24 kHz Transducers (ETN024T and ETN024G)

The 24 kHz transducer is a ceramic type. It has a beam angle of 20 degrees, and a 40 m cable length.

The fittings for the ETN024T transducer is ETNSTCLF (Steel Tank) or ETNSTCILF (Ice Tank). When using a Gate Valve (SB-200) the correct transducer part no. is ETN024G.

The transducer includes a junction box and mounting materials.

38 kHz Transducers (ETN038T and ETN038G)

The 38 kHz ceramic transducer has a beam angle of 16 degrees, and a 40 m cable length.

The ETN038T can be mounted in the ETNSTCLF (Steel Tank) or ETNSTCILF (Ice Tank). The ETN038G transducer can be mounted in the SB-200 (Gate Valve).

The transducer includes a junction box and mounting materials.

50 kHz Transducers

The 50 kHz ceramic transducer has a beam angle of 33 degrees.

There is a choice of two different cable length with the 50 kHz transducer, namely 25 and 40 m.

Transducer	Cable length (m)	Beam (degrees)	Installed in
ETN050T	25	33	ETNST, ETNSTC, ETNSTCI and ETNAL Steel and Aluminium Tank
ETN050XT	40	33	ETNST, ETNSTC, ETNSTCI and ETNAL Steel and Aluminium Tank
ETN050G	25	33	SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB Gate Valves.
ETN050XG	40	33	SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB Gate Valves
ETN050BEL	25	33	ETNSLJB Gate Valve
ETN050BELX	40	33	ETNSLJB Gate Valve
ETN050TA	25	33	ETNALC Aluminium Tank
ETN050XTA	40	33	ETNALC Aluminium Tank

The transducer includes a junction box and mounting materials.

200 kHz Transducers

The 200 kHz ceramic transducer has a beam angle of 6 or 10 degrees depending whether it is 100 mm or 50 mm in diameter.

There is a choice of two different cable lengths and two different diameters with the 200 kHz transducer:

Transducer	Cable length (m)	Beam (degrees)	Diameter (cm)	Installed in
ETN200T	25	6	10	ETNST Steel Tank
ETN200XT	40	6	10	ETNST Steel Tank
ETN200ST	25	10	5	ETNAL, ETNST, ETNSTC and ETNSLJB Aluminium and Steel Tank.
ETN200SXT	40	10	5	ETNAL, ETNST, ETNSTC and ETNSLJB Aluminium and Steel Tank.
ETN200SG	25	10	5	SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB Gate Valves
ETN200FS	25	10	5	ETNSLJB Gate Valve
ETN200FSX	40	10	5	ETNSLJB Gate Valve
ETN200STA	25	10	5	ETNALC Aluminium Tank
ETN200SXTA	40	10	5	ETNALC Aluminium Tank

The transducer includes a junction box and mounting materials.

Gate Valves and Tanks for Echo Sounders

The bottom parts are needed in order to fit the transducers into the hull of the ship. The bottom parts delivered by SKIPPER are approved by Det Norske Veritas (DNV). It is also possible to get approval by other classification authorities on request.

SKIPPER always recommends to install the transducers into Gate Valves. It is then much easier to change the transducer, and to maintain and clean the transducers regularly without entering any dry-dock or using divers. The installation of a tank will require installation of cable pipes above load water line. This is time consuming, costly, and, when everything is taken into consideration, normally the installation of Gate Valve will often be the cheapest option for installation.

Standard Tank (ETNST)

Our standard tank is delivered with a special red coating in order to protect the tank during transport and storing. The tank is made of durable approved steel in order to withstand the harsh environment it is exposed for.

There are several transducers that fits into this tank. Please see the section for transducers.

Combo Tank (ETNSTC)

The Combo Tank is similar to the Standard Tank, the difference being a flange that is installed inside in order to fit various transducers and sensors.
The red coating is the same as for standard tank as well as the steel.

Ice protected Tank (ETNSTCI)

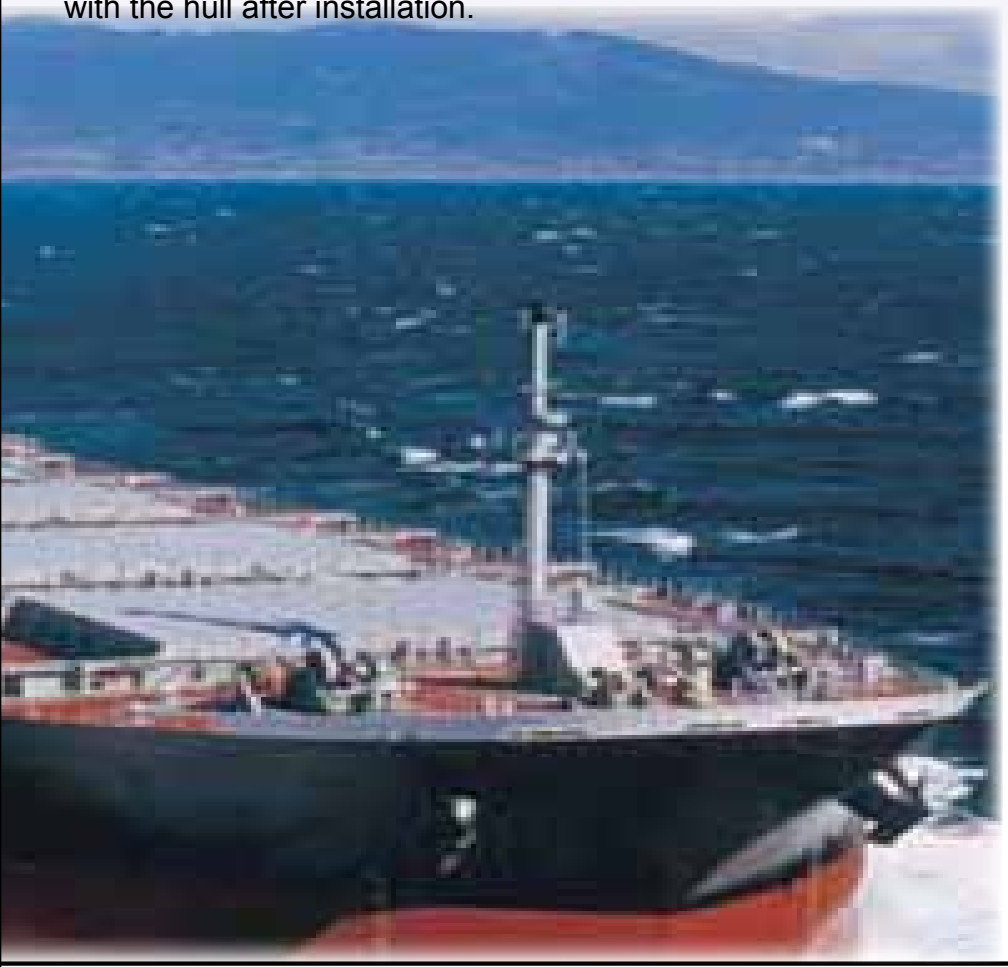
The ice protected tank is, as described by the name, made in order to protect the transducer from ice in arctic sea waters. The tank is similar to the Combo Tank, the difference being an “accustic see through” plate placed in front of the transducer. The tank is filled with water and the cable pipe extended above the load water line as well as for the Standard and Combo Tanks.

The ice protected tanks include all the fittings for the transducers and a junction box in order to extend the cable.

This tank is required for the NAUT-OSV class if a Gate Valve is not used.

Aluminium Tank (ETNAL)

The aluminium tank from SKIPPER is made in order to fit the 50 and 200 kHz transducers. This tank is ideal for mounting in aluminium hulls or to be moulded into composite hulls. The aluminium tank is not DNV certified and will need to be approved with the hull after installation.



100 mm Gate Valve for single bottom (SB-100-SA)

The SB-100-SA is the 100 mm bronze Gate Valve for SKIPPER transducers. Watertight cable piping is not needed for the cabling when using Gate Valves. The Gate Valve is delivered complete and assembled before shipment. A 0.5 m extention tube is delivered with the Gate Valve in order to lower the transducer into the Gate Valve, and keep it in correct position.

100 mm Gate Valve for double bottom (DB-100-SA)

If the ship comes with double bottom, or the valve needs to be moved away from the hull, the DB-100-SA is needed. This is a special designed Gate Valve for double hull configuration. As seen on the illustration, it is delivered with a flange that needs to be welded on the outer hull.
The Gate Valve is installed inside of the inner hull, and is connected with the flange by use of a intermediate pipe (yard supply because of difference in interhull distance).

100 mm Ball Valve for single bottom (SB-100-SB)

The SB-100-SB is an alternative to the SB-100-SA. The difference being that the SB-100-SB is a Ball Valve with a lever to close the valve. It is also made of stainless steel. Some confined spaces will make SB-100-SA or SB-100-SB version more suitable. Please contact SKIPPER for details in space needed for each separate Gate Valve, or visit www.skipper.no for download of installation manuals.

100 mm Ball Valve for double bottom (DB-100-SB)

The DB-100-SB is the Ball Valve in stainless steel to be installed in a double hull configuration. As standard SKIPPER deliver 2 x 0.5 m and 1 x 1 m extension pipe to lower the transducer into the Ball Valve. Extra extension pipes are available on request.

Echo Sounder Systems and Options

GDS102

YES! - GDS102 is needed

What features do you need?
Flexible frequency 10-255 kHz?
View two channels simultaneously?

DISPLAY

EN102C
GDS102 Display
10-255 kHz

EN104 & EN105B
Printers

ENIR301-SA
Depth
Repeater

IR30DIM
Remote
Dimmer

ZZL-01019
Junction Box

Junction Box

Transducers

Custom sensor
200 mm

ETN024G
Transducer
24 kHz w/40 m
cable

ETN038G
Transducer
38 kHz w/40 m
cable

ETN024T
Transducer
24 kHz w/40 m
cable

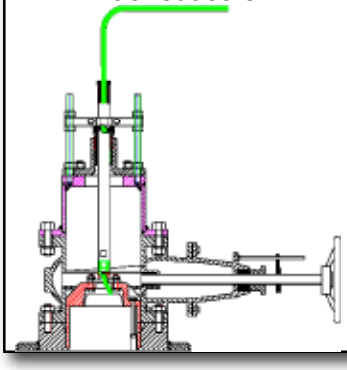
ETN038T
Transducer
38 kHz w/40 m
cable

ETN050(X)T
Transducer 50
kHz w/25 m
(40 m) cable

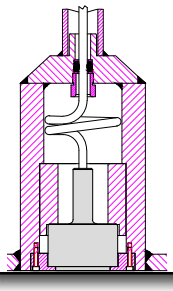
ETN050(X)TA
Transducer
50 kHz w/25 m
(40 m) cable for
aluminium tank

ETN200S(X)TA
Transducer
200 kHz w/25 m
(40 m) cable for
aluminium tank

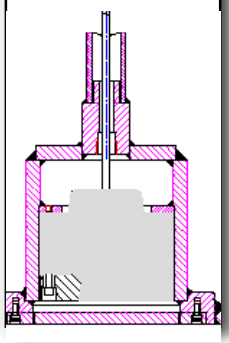
SB-200-SA
200 mm Gate Valve
Single bottom
for low frequency
transducers



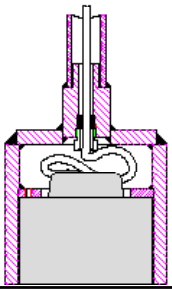
ETNALC
Combo
AluminiumTank
(No approval)



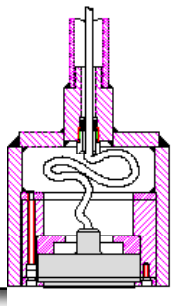
ETNSTCILF
ICE Class
Protected Steel
Tank for low
frequency
transducers



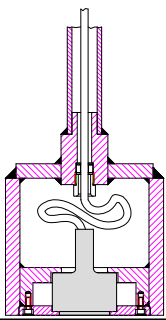
ETNSTCLF
Combo Steel
Tank for low
frequency
transducers



ETNSTC
Combo Steel
Tank



ETNST
Steel Tank



BOTTOM PARTS

NO! - GDS101 is needed

GDS101

ENS518
Transducer selector

SKIPPER Electronics AS
www.skipper.no
Tel. +47 23 30 22 70
Fax. +47 23 30 22 71
sales@skipper.no

EN101C-SA
GDS101 Display
38, 50 and 200 kHz

ZZL-01019
Junction Box

ETN200(X)T
Transducer 200 kHz w/25 m (40 m) cable

ETN200S(X)T
Transducer 200 kHz w/25 m (40 m) cable

ETN050G(X)
Transducer 50 kHz w/25 m (40 m) cable

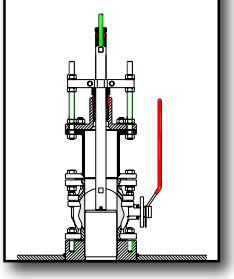
ETN200S(X)G
Transducer 200 kHz w/25 m (40 m) cable

ETN050BEL(X)
Transducer 50 kHz w/25 m (40 m) cable

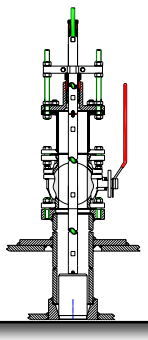
ETN200FS(X)
Transducer 200 kHz w/25 m (40 m)cable

ETN050(X)GI
Transducer 50 kHz w/25 m (40 m) cable for Seavalve ICE Class Prot.

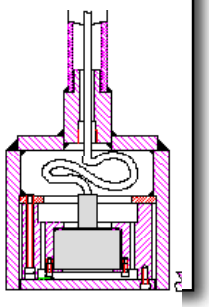
SB-100-SB
100 mm Seavalve Single bottom Ball Valve



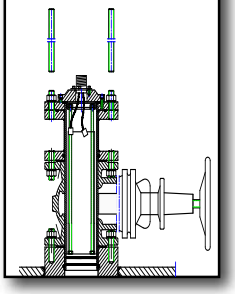
DB-100-SB
100 mm Seavalve Double bottom Ball Valve



ETNSTCI
ICE Class Protected Steel Tank



ETNSLJB
100 mm Seavalve Single bottom Bronze



Navigational Speed Logs

SKIPPER DL850 540 kHz Dual axis Doppler Speed Log

The SKIPPER DL850 540 kHz is one of our most sold Navigational Doppler Speed Logs. It provides longitudinal and fore/aft transversal ship speed relative to the sea bed and the water simultaneously. The DL850 540 kHz provides accurate navigation parameters measured as they happen, and it presents the data in a logical, user friendly way.

Highlighted features as:

- Bottom track of speed
- Water track of speed
- Depth readout
- Sea temperature
- Wheelmark
- On screen diagnostics
- Logging functions

Specifications for the DL850 540 kHz:

	DL 850-540	Units
Primary frequency	540	kHz
Speed range (longitudinal and transversal)	+/-40	knots
Bottom lock	1-75	meters
Water track (from)	2	meters
Aft transversal speed	optional	
Pulse output power (rms)	100	Watt
Accuracy (better than)	0.2	knots
Echo Sounder		
Range	100	meters
Frequency	270	kHz
Max output power	100	Watt
Accuracy error	<1	%
Temperature accuracy error	<1	°C
Mounting		
Gate Valve:		
Single bottom	Yes	
Double bottom	No	
Tank:		
Steel tank	No	
Aluminium tank	No	
Depth alarms	Deep and shallow limits	
Speed alarms	High and low speed limits	
Clock	- Year-month-day/Hour-min. (taken from GPS if available)	

Outputs	- 2 x NMEA 0183
	- 3 x 0-10 V or 4-20 mA Analogue
	- 3 x contact closure (pulse)
	- Alarm (Relay)
	- VGA additional screen
Inputs	- 2 NMEA 0183 (OPTO Isolated)
Accepted NMEA formats	
Inputs:	
Gyro	ROT, HDT
GPS	GLL, GGA, RMC, VTG
Echo	DPT, DBS, DBT, DBK
Outputs:	
Speed	VBW, VHW, VTG
Distance	VLW
Depth	DPT, DBS, DBT, DBK
Others	MTW (temp), ALR (alarm)
Power Supply	AC: 115/230 V 50/60 Hz DC: 24-32 V, Auto switch over
Power Consumption	Max. 100 W
Display	Night/Day (10.4”) Colour LCD screen with adjustable backlight.
Memory	Compact Flash - For retaining operational settings and diagnostic data
Language	English
Accessories	IR300 Speed (with aft speed), Dimming Control
Classification	IMO

SKIPPER DL850 270 kHz Dual axis Doppler Speed Log

The SKIPPER DL850 270 kHz is our newest Doppler Speed Log. It works in the same way as the DL850 540 kHz, with some modifications. The lower frequency gives the possibility of tracking bottom speed to greater depths than the 540 kHz version.
The DL850 270 kHz can be mounted using several options, such as gate valve for double bottom and in tank.

It contains features as:

- Bottom track of speed
- Water track of speed
- Depth readout
- Sea temperature
- Wheelmark
- On screen diagnostics
- Logging functions

Specifications for the DL850 270 kHz:

	DL850-270	Units
Primary frequency	270	kHz
Speed range (longitudinal/ transversal)	+/-40	knots
Bottom lock	1-200	meters
Water track (from)	2	meters
Aft transversal speed	optional	
Pulse output power (rms)	100	Watt
Accuracy	<0.2	knots
Echo Sounder		
Range	200	meters
Frequency	270	kHz
Max output power	100	Watt
Accuracy error	<1	%
Temperature accuracy error	<1	°C
Mounting		
Gate Valve:		
Single bottom	Yes	
Double bottom	Yes	
Steel tank	Yes	
Aluminium tank	Yes	
Depth alarms	Deep and shallow limits	
Speed alarms	High and low speed limits	
Clock	- Year-month-day/Hour-min. (taken from GPS if available)	

Outputs	- 2 x NMEA 0183
	- 3 x 0-10 V or 4-20 mA Analogue
	- 3 x contact closure (pulse)
	- Alarm (Relay)
	- VGA additional screen
Inputs	- 2 NMEA 0183 (OPTO Isolated)
Accepted NMEA formats	
Inputs:	
Gyro	ROT, HDT
GPS	GLL, GGA, RMC, VTG
Echo	DPT, DBS, DBT, DBK
Outputs:	
Speed	VBW, VHW, VTG
Distance	VLW
Depth	DPT, DBS, DBT, DBK
Others	MTW (temp), ALR (alarm)
Power Supply	AC: 115/230 V 50/60 Hz DC: 24 V, Auto switch over
Power Consumption	Max. 100 W
Display	Night/Day (10.4”) Colour LCD screen with adjustable backlight.
Memory	Compact Flash - For retaining operational settings and diagnostic data
Language	English
Accessories	IR300 Speed (with aft speed), Dimming Control
Classification	IMO

SKIPPER EML224 Dual Axis Electromagnetic Speed Log

The SKIPPER EML224 is SKIPPERs most sold Electromagnetic Speed Log. It is a dual axis Speed Log using the electromagnetic principle, providing longitudinal and transversal ship speed relative to sea water. The EML224 gives accurate navigation parameters, measured as they happen, and the data is presented in a logical, user friendly way.

Highlighted features as:

- Speed through water in dual axis
- Sea temperature
- Fully automated settings
- Easy setup and diagnostics.
- NMEA 0183
- IMO Wheelmarked

Specifications for the EML224:

	EML224	Units
Number of Axis	2	
Speed range Long	±40	knots
Speed range Trans	±40	knots
Water track (from)	0	meter
Accuracy (better than)	0.2	knots
Temperature Accuracy error	< 1	°C
Mounting Dimensions	300 x 320 mm	
Front plate	320 x 340 mm	
Depth	165 mm	
Weight cabinet	10 kg	
Mounting		
Gate Valve:		
Single bottom	Yes	
Double bottom	Yes	
Tank:		
Steel	Yes	
Aluminium	Yes	
Alarms	- High and low speed limits - Power failure	

Outputs	- 2 x NMEA 0183 - 3 x contact closure (pulse) - Alarm (Relay)
Inputs	- 2 NMEA 0183 (OPTO Isolated)
Accepted NMEA formats	
Outputs:	
Speed	VBW, VHW
Distance	VLW
Others	MTW (temp), ALR (alarm)
Power Supply	AC: 115/230 V 50/60 Hz. DC: 24 V, Auto switch over
Power Consumption	Max. 100 W
Display	Night/Day (10.4”) Colour LCD screen with adjustable backlight.
Language:	English
Accessories:	IR300 Speed repeater Dimming control
Classification:	IMO
Service:	Available in most major harbours, world-wide through extensive dealer network.

SKIPPER EML224 Compact, Single and Dual axis Electromagnetic Speed Log

The SKIPPER EML224 Compact is the newest electromagnetic Speed Log. The difference from the EML224 is that the operator unit (display) is smaller. The EML224 Compact is available in single or dual axis, making it more flexible depending on customers needs and demands.

Highlighted features as:

- NMEA 0183
- Compact display (144 x 144 mm)
- Alarm functions
- IMO Wheelmarked
- Speed through water in 1 or 2 axis
- Fully automated settings
- Support software for easy setup and diagnostics

Specifications for the EML224 Compact:

Log	EML124 Compact	EML224 Compact	
Number of Axis	1	2	
Speed range Longitudinal	±40	±40	knots
Speed range Transversal		±40	knots
Water track (from)	0	0	meter
Accuracy (better than)	0.2	0.2	knots
Temperature Accuracy error	< 1	< 1	°C
Mounting Dimensions	124 x 124 mm. Bracket or panel mounting		
Front plate	144 x 144 mm		
Depth	59 mm		
Weight cabinet	1 kg		
Standard cable length	10 m (max 20 m)		
Mounting			
Gate Valve:			
Single bottom	Yes	Yes	
Double bottom	Yes	Yes	

Tank:		
Steel	Yes	Yes
Aluminium	Yes	Yes
Speed alarms	High and low speed limits Power failure Sensor failure	
Outputs	- 2 x NMEA 0183 - 1 x contact closure (pulse) - Alarm (Relay) - Fitness	
Inputs	- 1 NMEA 0183 (OPTO Isolated) - External dimming (pulse)	
Accepted NMEA formats		
Outputs:		
Speed	VBW, VHW	
Distance	VLW	
Others	MTW (temp)	
Power Supply	AC: 115/230 V 50/60 Hz. DC: 24-32 V, Auto switch over.	
Power Consumption	Max. 30 W	
Display	28 x 30 pixle alphanumeric LEDs (red) with dimming.	
Language	English	

SKIPPER IR300 Digital Speed Repeater

The SKIPPER IR300 is a remote speed indicator for NMEA signals. It is designed for use with SKIPPER DL850 and EML224. It may also be used with Speed Logs from other manufacturers, when these have an NMEA 0183 output.

Highlighted features as:

- Speed indicator
- Alarms - Speed alarm
- Trip counter
- Distance counter
- One, two or three axis indication
- Bracket or panel mounting

Specifications for the IR300:

Power Supply	DC: 10-40 V
Power Consumption	3 W at 24 V
Display	2 lines with 7 segments 20 x 11 mm 1 line with 7 segments 20 x 11 mm
Display outputs	Speed over ground (bottom track) - Longitudinal - Transversal fore - Transversal aft (Docking)
	Speed through water (water track) - Longitudinal - Transversal fore - Transversal aft (docking)
	Distance travelled through water - Trip - Total
Mounting Dimensions	124 x 124 mm. Bracket or panel mounting
Front plate	144 x 144 mm to DIN standard
Depth	59 mm
Weight cabinet	1 kg
Protection	IP 56

Measuring Accuracy	2 % or better
Outputs	1 x NMEA 0183
Inputs	NMEA 0183 protocols
	Remote dimmer input
	VBW for speeds
	VLW for distance travelled
Classification	Made acc. to IMO performance standard
Service	Available in most major harbours, world-wide through extensive dealer network

SKIPPER CD401 LR Digital Speed Repeater

The SKIPPER CD401 LR is a remote speed indicator for NMEA signals. It is designed for use with SKIPPER DL850 and EML224. It may also be used with Speed Logs from other manufacturers, when these have an NMEA 0183 output.

Highlighted features as:
- Speed indicator
- Trip counter
- Distance counter
- One, two or three axis indication
- Bracket or panel mounting

Specifications for the CD401 LR:

Power Supply	DC: 18-36 V
Power Consumption	3 W at 24 V
Display	3 lines with LED
Display outputs	Speed over ground (bottom track) - Longitudinal - Transversal fore - Transversal aft (docking)
	Speed through water (water track) - Longitudinal - Transversal fore - Transversal aft (docking)
	Distance travelled through water - Trip - Total
Mounting Dimensions	124 x 124 mm. Bracket or panel mounting
Front plate	144 x 144 mm
Depth	59 mm
Weight cabinet	1 kg
Protection	IP 56
Measuring Accuracy Error	2 % or better.

Outputs	2 x NMEA 0183
Inputs	NMEA 0183 protocols
	Remote dimmer input
	VHW for speeds
	VLW for distance travelled
	VBW for speeds
	MTW for temp
Classification	Made acc. to IMO performance standard
Service	Available in most major harbours,world-wide through extensive dealer network

Speed Log Sensors

SKIPPER manufacture all the Sensors to the SKIPPER Speed Logs. SKIPPER manufacture two different Speed Log families, Doppler Speed Logs and Electromagnetic Speed Logs. The Doppler Speed Log consists of two versions based on the frequencies; 540 kHz and 270 kHz.

DL850 540 kHz Doppler Speed Log Sensor

DL850S-SA

The DL850 540 kHz sensor consists of 4 ceramic transducers for measuring speed and 1 lower frequency transducer for measuring depth. This sensor is always installed in the 100 mm Gate Valve ETNSLB for single bottom configuration.

There are two options for cables, 30 and 40 m. This Doppler sensor gives speed through water and speed over ground down to 75m depth.

Sensor	Part no.	Cable length	Installed in
Sensor 540 kHz	DL850S-SA	-	ETNSLB 100 mm Gate Valve
Cable w/plug	SC30-SA	30 m	DL850S-SA
Cable w/plug	SC40-SA	40 m	DL850S-SA

DL850 270 kHz Doppler Speed Log Sensor

DL850S27G-SA

The 270 kHz sensor consist of a moulded sensor housing with three ceramic transducers angled at 30°. The depth is calculated and can not be directly read out. The sensor is delivered with a 40m cable as standard. The sensor can be installed in tank or Gate Valve, for double and single bottom configurations.

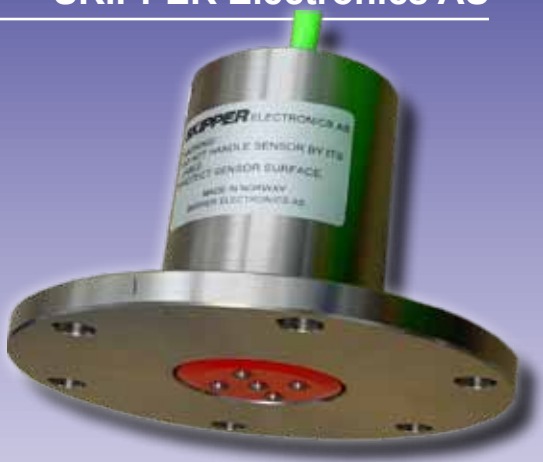
DL850S27T-SA

Sensor	Part No.	Cable length (m)	Installed in
Sensor 270 kHz	DL850S27E-SA	40	ETNSLB 100 mm Gate Valve (Retrofit)
Sensor 270 kHz	DL850S27G-SA	40	SB-100-SA, SB-100-SB, DB-100-SA, DB-100-SB. 100 mm Gate Valve
Sensor 270 kHz	DL850S27TA-SA	40	ETNALC Aluminium Tank
Sensor 270 kHz	DL850S27T-SA	40	ETNSTC Combo Steel Tank

EML224 Electromagnetic Speed Log Sensor

The EML224 sensor is moulded and comes with a 40 m cable as standard. This sensor can be mounted in a Tank or Gate Valve for double and single bottom.

EML224SG-SA



EML224ST-SA

Sensor	Cable length (m)	Installed in
EML224SG-SA	40	SB-60-SA and DB-60-SA. 60 mm Gate Valve
EML224ST-SA	40	ETNSTC Combo Steel Tank
EML224STA-SA	40	ETNALC Aluminium Tank
EML224SX-SA	40	PCSV60 60 mm Gate Valve (Retrofit)
EML224SN-SA	40	SIMRAD NL Log Gate Valve or Tank installation (Retrofit)
EML224SDB-SB	40	SB-100-SA, SB-100-SB, DB-100-SA and DB-100-SB. 100 mm Gate Valve

Gate Valves and Tanks for Speed Logs

The hull fittings are needed in order to fit the sensors into the hull of the ship. The bottom parts delivered by SKIPPER are approved by Det Norske Veritas (DnV). Approval by other classification authorities are available on requests.

SKIPPER always recommend to install the sensors into Gate Valves. It is much easier to change the sensor, and to maintain and clean the sensors regularly without entering any drydock or using divers. The installation of a Tank will require installation of cable pipes above load water line. This is time consuming, costly, and, when everything is taken into consideration, the installation of Gate Valve will often be the cheapest option for installation.

Combo Tank (ETNSTC)

The Combo Tank is specially made for SKIPPERs Speed Logs, DL850 270 kHz and the EML224 Speed Logs. The red coating as well as the steel alloy is the same for standard tank (ETNST). Tanks for Speed Logs have a mounting direction, and need to be installed correctly (please see the installation manual).

Aluminium Combo Tank (ETNALC)

The Aluminium Combo Tank is also specially made for SKIPPER Speed Logs. Please note that the aluminium tank needs to be certified with the hull of the vessel after installation.

60 mm Ball Valve for single bottom (SB-60-SA)

SKIPPER 60 mm Ball Valve is manufactured for the EML Speed Logs. It is made in stainless steel, and the Ball Valve is operated with a lever. Because of the small size, it is easy to fit into small spaces at the bottom of the vessel.

The SB-60-SA is delivered with a 0.5 m extension tube in order to mount the SKIPPER EML sensor.

60 mm Ball Valve for double bottom (DB-60-SA)

If the vessel is constructed with a double bottom, or the valve needs to be moved away from the hull, the correct solution is the DB-60-SA. As seen on the figure this Ball Valve is delivered with an extra flange to be installed in the outer hull of the vessel. The interhull distance is different for each hull setup, so the piping between the outer and the inner hull is yard supply and need to be welded between the outer hull flange and the inner hull flange.
Please see the installation manual for further information on the installation procedure. For use with SKIPPER EML Speed Logs only.

The DB-60-SA is delivered with 1 m and 0.5 m extension tubes. Extra extension tubes are available on request.

100 mm Gate Valve for single bottom (SB-100-SA)

The SB-100-SA is a 100 mm bronze Gate Valve for the DL850 270 kHz sensors. Watertight piping above load waterline, for the cabling, is not necessary when using a Gate Valve. The Gate Valve is delivered complete, and it is assembled before shipment. 0.5 m pipe is delivered with the Gate Valve in order to lower the sensor to the correct position of the valve assembly.

100 mm Gate Valve for double bottom (DB-100-SA)

If the vessel is constructed with double bottom, or the valve needs to be moved away from the hull, the DB-100-SA is the correct solution. This is a specially designed Gate Valve for double bottom. As seen on the illustration, it is delivered with a flange that needs to be welded into the outer hull.
The Gate Valve is installed on the inside of the inner hull, and is connected with the flange by use of an intermediate pipe (yard supply because of difference in interhull distance).

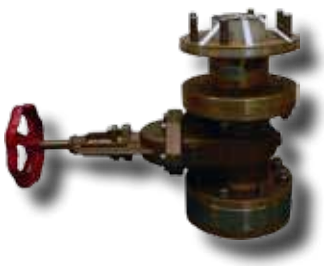
100 mm Ball Valve for single bottom (SB-100-SB)

The SB-100-SB is an alternative to the SB-100-SA, the difference is that the SB-100-SB has a Ball Valve with a lever to close the valve instead of the screw operation of the SB-100-SA valve and it is made in stainless steel.
Difference in space in the installation location would require the choice between the SB-100-SA and the SB-100-SB. Please contact SKIPPER for details in space needed for each separate Ball Valve, or visit www.skipper.no for downloads of installation manuals and installation videos.

100 mm Ball Valve for double bottom (DB-100-SB)

The DB-100-SB is our Ball Valve in stainless steel to be installed in a double bottom configuration. 2 x 0.5 m and 1 x 1 m extension pipe to lower the transducer in the Ball Valve are delivered as standard together with the Ball Valve. Extra extension pipe is available on request.

100 mm Gate Valve for single bottom (ETNSLB)



The ETNSLB is designed for our DL850 540 kHz Doppler Speed Log. It is a 100 mm Gate Valve, and can be used for any single bottom installation. It is also possible to fit a DL850 270 kHz sensor into the ETNSLB for retrofit purposes.

Speed Log Systems and Options

DISPLAY

EML 224 Electromagnetic Speed Log

NO! - EML Option is needed

What features do you need?
Bottom track?
Acoustic sensor?
Vessel over 50 000 tonne?

CD401-E2
Dual Axis
Compact Display

CD401-E1
Single Axis
Compact Display

EML224N-SA
Dual Axis
Display

Repeaters/Remote dimmer

ENIR300PD-SA

CD401-LR

IR30DIM

MAX 10m

ELECTRONIC UNIT/ TRANSCEIVER

JB60CD-SA
Electronic Unit
Max. 10 m from
Compact display

JB60N2-SA
Electronic Unit

SKIPPER Electronics AS
www.skipper.no
Tel. +47 23 30 22 70
Fax. +47 23 30 22 71
sales@skipper.no

SENSOR

Retrofit

New installations

EML224SN-SA
Log Sensor for
Simrad NL-Log
Tank or Valve

EML224SX-SA
Log Sensor
for PCSV60
Seavalve

EML224SDB-SB
Log Sensor
for 100 mm
Seavalve

EML224SG-SA
Log Sensor for
60 mm Seavalve

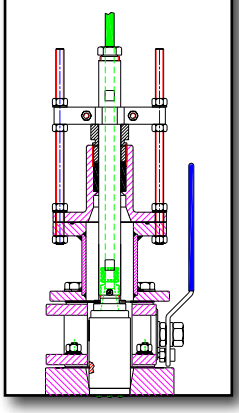
EML224ST-SA
Log Sensor for
Combo Steel
Tank

EML224STA-SA
Log Sensor for
Combo
Aluminium Tank

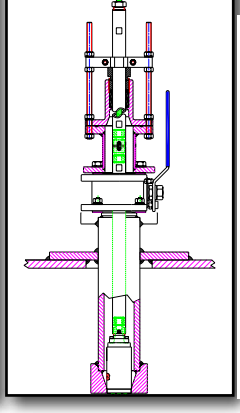
BOTTOM PARTS

Gate Valve
already installed
in the vessel

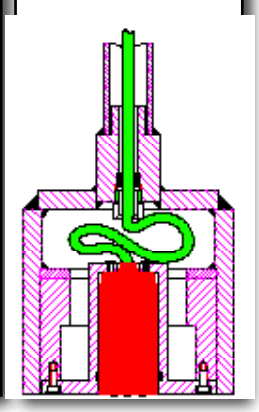
SB-60-SA
60 mm Seavalve
Single bottom
Ball Valve



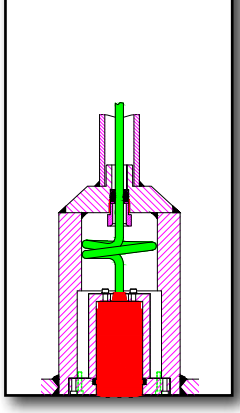
DB-60-SA
60 mm Seavalve
Double bottom
Ball Valve



ETNSTCL
Combo Steel
Tank



ETNALC
Combo
AluminiumTank
(No approval)



YES! - Doppler Option is needed

DL850 Doppler Speed Log

Bottom track max 160 m
Single/Double bottom fit
aluminium fit.

Bottom track max 80m
Only Single Bottom fit.

DL850D27-SD
Display with Docking
270 kHz

DL850N27-SD
Display
270 kHz

DL850D-SC
Display with Docking
540 kHz

DL850N-SC
Display
540 kHz

DL850T27-SB
270 kHz
Transceiver
Cabinet

DL850T-SA
540 kHz
Transceiver
Cabinet

DL850S27TA-SA
Log Sensor
for Combo
Aluminium Tank

DL850S27T-SA
Log Sensor for
Combo Steel
Tank

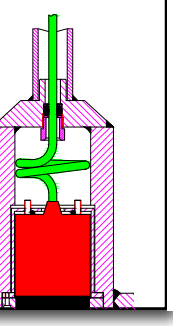
DL850S27G-SA
Log Sensor
for 100 mm
Seavalve

Retrofit

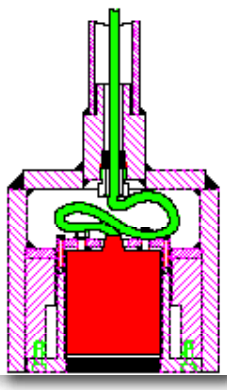
DL850S27E-SA
Log Sensor
for ETNSLB
Seavalve

DL850S-SA
Log Sensor for
ETNSLB
Seavalve

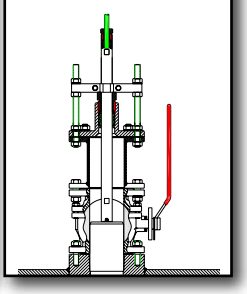
ETNALC
Combo
miniumTank
o approval)



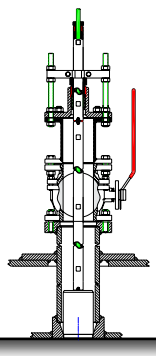
ETNSTCL
Combo Steel
Tank



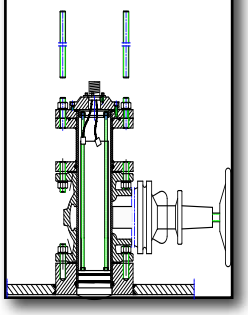
SB-100-SB
100 mm Seavalve
Single bottom Ball
Valve



DB-100-SB
100 mm Seavalve
Double bottom
Ball Valve



ETNSLB
100 mm Seavalve
Single bottom
Bronze



DGR360 Digital Gyro Repeater

DGR360 is a digital gyro repeater that displays the Heading Angle in the LED 7 segment display and indicates the direction of turn with 30 dual colour surrounding LEDs, changing from green to red depending on the direction of turn.

Highlighted features:

- Digital gyro repeater
- Heading angle
- HDT/THS signals
- Bracket or panel mounting

The DGR360 will display Heading Angle given by the Heading message from a gyro or other equipment (NMEA 0183) and indicate “Direction of Turn” by calculating change in heading based on the HDT/THS input and the time between each message.

The dimming may be controlled by pressing the dimming key or by using an external dimming key.

Specifications:

Power Supply	DC: 20-32 V
Power Consumption	2 W at 24 V
Display	1 line with 7 segments 30 x 20 mm
Display outputs	Heading (HDT, THS) from gyro compass or other HDT/ THS devices
	Analogue indication of turn direction speed (red/green LEDs)
Standard Cable length	2 m
Compass safe distance	85 cm
Cut-Out Dimensions	190 x 158 mm. Bracket or panel mounting.
Front plate	220 x 170 mm
Depth	63 mm
Weight cabinet	2 kg
Protection	IP 56
Outputs	NMEA 0183

Inputs	NMEA 0183 protocols Sentence: $--HDT, $--THS
	Remote dimmer input, pulse.
Classification	IEC 60945/2002
Service	Available in most major harbours, world-wide through extensive dealer network.

Quality Standards

An excellent quality is important for SKIPPER and will always be our main target. SKIPPER is continuously improving the quality of the existing products and all new products in the pipeline. It is important not only that the products leave SKIPPER in good condition, but also that the quality of the products remain excellent throughout its lifetime.

SKIPPER Electronics AS is approved with the standards as listed below:

- ISO 9001
- IMO wheelmark

All our Steel Tanks, Gate Valves and Ball Valves are DnV approved. Approvals from other authorities can be provided on request.

DET NORSKE VERITAS

QS - CERTIFICATE OF ASSESSMENT - EC

CERTIFICATE NO. MED-D-708

This is to certify that the Quality System for the products

Echo-sounding equipment /

Speed and distance measuring equipment (SDME)

with product designations as specified in the Appendix to this certificate

Manufactured by

Skipper Electronics AS

OSLO, Norway

is found to comply with the requirements applicable to it.

The quality system for the product, defined in Annex A.1, Item No. A.1/4.6 and A.1/4.7 has been assessed with respect to the procedure of conformity assessment described in Annex B, Module D in the directive.

Limitations:

Modifications made to the Quality System shall immediately be reported to Det Norske Veritas AS in order to examine whether this Certificate remains valid. Annual periodical audits will be held to verify the validity of the certificate.

Place and date: Høvik, 2005-11-07

This Certificate is valid until: 2010-11-07

for DET NORSKE VERITAS AS

Tore Morten Wenerhaug

Manager, MTPNI370

Department Systems & Components

Notified Body No.: 0575

Arve Lepsøe

Surveyor

DNV local office: DNV Oslo

Management System

Certificate

NS-EN ISO 9001:2008

SKIPPER

Skipper Electronics AS

For leveranser av navigasjons- og elektronisk fiskeletningsutstyr

151

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Find out all about SKIPPER products, support and training on our web site:

www.skipper.no

SKIPPER

Version 1.02